



Epi notes

Summer 2011

North Carolina Department of Health and Human Services | Division of Public Health | www.epi.state.nc.us/epi

Acute Pesticide Illness and Injury Surveillance in North Carolina 2007 - 2009

Pesticides are used widely in agriculture and in many other settings like homes, businesses and schools. These chemicals are designed to be toxic to certain life forms but can adversely affect nontarget species. Exposure potential is high due to North Carolina's agricultural prominence and number of farm workers and their families present here. The Occupational and Environmental Epidemiology Branch (OEEB) initiated surveillance in 2007 to monitor health effects related to pesticide use. This report summarizes surveillance findings for 2007 - 2009.

The primary source for pesticide acute poisoning reports is Carolinas Poison Center, as supported by a mandatory reporting law. Upon receipt, cases are evaluated, classified, and a severity score assigned. Severity is based on signs and symptoms and whether medical care was sought, the affected individual was hospitalized, or lost time occurred from work or usual activities. North Carolina uses a standardized case definition, classification scheme, and severity index developed by the U.S. Centers for Disease Control and Prevention.

Occupational exposure:

There were 122 confirmed cases from occupational exposure and most were of low severity. Low severity indicates that symptoms were mild and typically resolved without treatment or lost time from work or normal activities. Confirmed cases were mostly white. Twenty-two percent were Hispanic. Most cases were between 20-29 years of age. Workers in agriculture accounted for approximately one third of all cases, followed by workers employed in landscaping and pest control. Farm laborers were the most affected group within agriculture. Most occupational cases were exposed when applying pesticides on the skin. Insecticide products accounted for most of the exposures; the majority of these were pyrethroid insecticides. Most exposures occurred during the summer months.

Nonoccupational exposure:

There were 1002 confirmed cases from nonoccupational exposure and most were of low severity. Race and ethnicity data were too limited to report. Most cases were in people between 40 - 49 years old. Almost one in five individuals were children age 9 and below. The two deaths for the report period resulted from nonoccupational exposure; one involved a suicide and the other an accidental ingestion by a 7 year old boy.

Most exposures occurred at a residence and resulted from application of pesticides. Individuals were usually treating interior building surfaces or the structure and the primary route of exposure was inhalation. Insecticide products accounted for most exposures; the majority of these were pyrethroid insecticides. Most exposures occurred during the summer months.

Surveillance findings for 2007 - 2009 indicate that most pesticide exposures were nonoccupational, occurred in a residence and also occurred during the summer. Occupational exposures were less common than anticipated and typically occurred during the agricultural growing season. Most exposures were not serious. Insecticides were responsible for most exposure in both groups. Case counts are likely minimum estimates due to under-reporting.

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N.C. trends are similar to national data. Data show agriculture has the largest proportion of work-related pesticide poisoning cases, and these occur mostly during the summer months. Severity is low and insecticides are responsible for most exposures. Typically, workers are doing routine work instead of applying (Calvert et al., 2003). The high number of home-exposures are consistent with what is reported by other state surveillance programs (MI, 2009 & OR, 2010) and published use and incident data. EPA reports three-fourths of American households use pesticides (U.S. EPA, 2011). Pesticides rank 10th among substance

categories most frequently involved in human exposures (Bronstein et al, 2010). The predominant source of exposure for pesticide poisonings in the United States is insecticides (Blondell, 2007). Pyrethroids have replaced more toxic pesticides for outdoor and indoor pesticide use over time. Much of the country's population is experiencing exposure to these products (CDC, 2005).

Submitted by:

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Multiple Units Within the State Public Health Lab Involved in Suspicious Substance Investigation

On Wednesday, June 8, 2011 at 3:20 p.m., the Bioterrorism and Emerging Pathogens (BTEP) Unit received a call from a federal law enforcement officer regarding a suspicious substance confiscated through a search warrant. The officer opened the package to find a brown powdery substance. It was determined to be a credible threat, and Regional Response Team 5 responded at the scene and performed a field test. Initial testing indicated the presence of dyes and high concentration of protein. Because it was deemed a credible threat, testing would be performed by the BTEP Unit for biothreat agents and for narcotics. The FBI Weapons of Mass Destruction Coordinator and Public Health Preparedness and Response (PHP&R) lead were notified of the situation by 3:45 p.m.

Using standard chain of custody procedures, the sample was accepted by the BTEP Unit and testing began at 8:30 p.m. BTEP staff members worked until 2:35 a.m. to provide preliminary results to the lead law enforcement agent, PHP&R and the NCSLPH chain of command. Because the sample had no detectable biological agents present, the officer requested that additional chemical characterization be performed. Testing by the Chemical Terrorism Unit (CT) and the Environmental Sciences Unit (ESU) began on Friday, June 10, using a variety of methods and instrumentation.

The CT Unit prepared five separate extracts of the light tan powder. Methylene chloride, methanol, hexane and water were used to dilute the powder, followed by analysis on a gas chromatograph/mass spectrometer for volatile organic compounds (VOCs) and

for unknown compounds. All significant peaks were compared to a NIST library. While no suspicious VOCs were detected in the prepared extracts, spectra consistent with a banned compound were observed in all extracts. The compound could not be quantitated due to lack of standards. The agent was notified of these results by phone on Monday, June 13.

The Environmental Sciences Unit (ESU) analyzed the sample by polarized light microscopy at 100X magnification and with a Fourier Transformed Infrared Analyzer (FT-IR). A portion of the sample was digested in concentrated nitric acid for metals analysis using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). Microscopy indicated crystalline structures 7.5 to 10 μ m in diameter, while FT-IR indicated a mixed chemical sample with low probability matches to compounds in the instrument library. No standards were available to reach valid conclusions. Analysis by ICP-MS identified sodium, magnesium and iron as the primary metals in the sample. These properties were inconsistent with commonly used paint pigments. The final reports were faxed to the lead law enforcement agency on June 15-16. Based on the chemistry results from the CT and Environmental Sciences Units, the federal agent had critical information to take forward in the investigation. The information provided by NCSLPH will inform any future forensic analysis by providing preliminary information as to the nature of the compound. This serves as a great example of collaboration within the laboratory to assist key partners in preparedness efforts.

Submitted by:

Leslie Wolf, Tanielle Willins, Kaye Flood and Cindy Price
State Laboratory of Public Health

Seventh Annual Clinical Laboratory Day

The Laboratory Improvement Unit of the North Carolina State Laboratory of Public Health is pleased to announce the 7th annual Clinical Laboratory Day on October 7, 2011. The theme for this year's event will be "Building Blocks for a Quality Laboratory: A Foundation for Success." This one-day conference is open to laboratorians across the state and will address important aspects of running a quality clinical laboratory. Topics include regulation compliance, CLIA basics, laboratory safety and motivating employees in a challenging economy. A panel of experts will also be available to answer a variety of laboratory questions.

The speakers for this year's program include experts within state government with experience and skills in the issues facing many laboratories. As an employee of the N.C. Institute for Public Health, David Stone was the administrator for the N.C. Local Health Department Accreditation Program and has over 27 years of public health experience. David is currently the Accreditation Education Specialist for the PH Accreditation Board (PHAB), Alexandria, VA. David began his career as a medical technologist at the State Laboratory and later served as a laboratory improvement consultant. He also has valuable experience in the local health department setting as assistant health director of Appalachian District Health Department and later as health director in Surry County. David will discuss compliance to standards and management tips for site visits and daily laboratory operations.

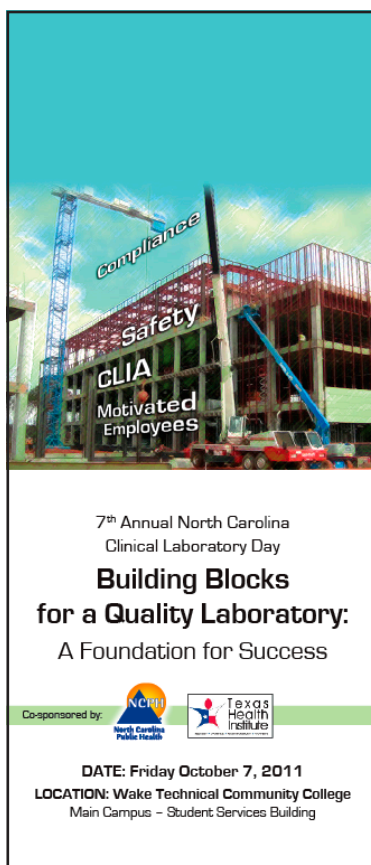
Tracey Shives is the regional laboratory improvement consultant for the Winston Salem area. She has served in this capacity since 2008, offering consultation and training to local health departments under the State Laboratory of Public Health (SLPH) CLIA Contract Program. Tracey has 17 years of experience as a laboratory professional, including five years of supervisory experience. She will discuss requirements for a CLIA certificate including personnel qualifications, proficiency testing, competency assessment and quality assurance.

Kristy Breedlove is in her ninth year as a Laboratory Improvement Consultant at SLPH. During that time, she has developed and presented numerous workshops and works closely with the SLPH Safety Officer to ensure a safe working environment for laboratory employees. Kristy holds an Advanced Safety Certificate from the National Safety Council and is also certified by MESH (Manager of Environmental, Safety and Health Programs). Kristy will identify the top 10 laboratory safety deficiencies and discuss how to avoid them and create a safe work environment.

The last presentation of the day will be given by Sondra Wilson, a Human Resources Consulting Partner with the Office of State Personnel. Sondra has more than 30 years of experience designing, developing and presenting training programs on topics such as leadership, communication, problem solving, change management, employee engagement, conflict, and talent management. She will discuss ways to keep employees focused, productive and motivated in an economically challenging environment where "do more with less" has become the motto.

This event will be beneficial to clinicians, clinical laboratory scientists, nurses, disease intervention personnel, educators and students. The \$35 registration fee includes full conference admission, vendor exhibits, morning and afternoon refreshments, lunch, and speaker handouts. All participants who complete the program in its entirety will be awarded 5.5 hours of P.A.C.E. continuing education contact hours. The deadline for registration is September 23, 2011 and may be completed on-line at www.quia.com/sv/525665.html. Payment must be in the form of a check or money order payable to Texas Health Institute. Mail payment to NCSLPH, Laboratory Improvement Unit, PO Box 28047, Raleigh, NC 27611. If additional information is needed, please contact Laboratory Improvement at 919-733-7186.

Submitted by:
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North Carolina Climate Change Indicators Data

North Carolina will see substantial temperature and weather changes in coming decades because of past emission-producing activities. These climate changes will have large impacts on public health, so indicators are being piloted by the Council of State and Territorial Epidemiologists (CSTE) to help develop appropriate and adequate responses. North Carolina is participating in the CSTE pilot study, examining indicators in the areas of environment, health, mitigation, adaptation, and policy.

Highlighted findings from environmental indicators:

- From 2000 to 2007, total greenhouse gas emissions showed a small increase, due to increases in the transportation and electric power sectors. From 1973-2008, no overall increase in air mass stagnation events was observed.
- From 2002-2010, the frequency and severity of wildfires did not increase. Generally, the frequency of fires had a parallel relationship to the total acres affected by wildfire.
- From 1999-2008, positive test results for West Nile Virus (WNV) in mosquitoes was parallel to the results in chicken sentinel flocks. Positive test results reached a peak in 2003, and declined to zero positives in 2008. Sentinels tested positive for WNV from 2001 through 2007, while mosquitoes tested positive for WNV from 2002 through 2004.



Highlighted findings from health indicators:

- From 1995-2009, heat-related morbidity and mortality showed no overall increase, with peaks in 1999 and 2005, as well as a peak in mortality in 2008. Most hospitalizations were due to unspecified exhaustion, heatstroke/sunstroke, water exhaustion, and syncope, respectively. Seventy-five percent of heat-related hospitalizations from 1995-2009 were males. Heat-related morbidity and mortality among emergency department (ED) visits in 2008 and

2009 showed a larger number of deaths (21 v. 2), hospitalizations (108 v. 80), and ED visits (2294 v. 1647) in 2008 versus 2009.

- From 1995-2009, no overall increase was seen among cases of allergic disease. The majority of hospitalizations for allergic disease were among females.

Highlighted findings from mitigation indicators:

- From 2000 to 2006, energy consumption per capita showed a small increase in the industrial sector, while staying the same in the residential, commercial, and transportation sectors.
- From 1992 to 2007, vehicle miles traveled per capita increased by about 2,000 miles.
- In 2006, N.C.'s renewable energy profile consisted of a majority hydroelectric (68%), with renewable energy also coming from wood and other derivative fuels (31%) and landfill gas/Municipal Solid Waste biogenic (1%).

Highlighted findings from adaptation indicators:

- The N.C. Climate Change Advisory Board has recommended the development of a state adaptation plan, which may address human health adaptation.
- The State Hazard Mitigation Plan has identified extreme heat and climate change as hazards, although it has not included cooling centers as a mitigation measure.
- One heat island mitigation plan exists in the state.
- Four health surveillance systems exist related to climate change.

Highlighted findings from policy indicators:

- Forty-three local NC governments participate in the US Conference of Mayors Climate Protection Agreement, which govern 30 percent of N.C.'s population.

- A state Climate Change Advisory Board has been developed in recent years, and a state greenhouse gas inventory has been completed. Two cities/localities have completed greenhouse gas inventories.
- Ten local governments, representing 20 percent of N.C.'s population, participate in ICLEI, a national climate change group comprising of local government leaders.
- A state climate change action plan has been completed, and two local climate change action plans have been completed.

For further reading on climate change indicators:

English et al. 2009. Environmental health indicators of climate change for the United States: Findings from the State Environmental Health Indicator Collaborative. Environmental Health Perspectives.

Submitted by:

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Summer Outdoor Safety: Prevention of Diseases Spread by Animals and Insects

Summer is the time when we look forward to vacations and wonderful outdoor activities like hiking, camping, sports, fishing, barbecues and sending kids to camp. Increased physical activity is healthy for us but it is equally important to be safe outdoors. Consider sharing some or all of the following information to remind people in your community to prevent exposures to animals and insects and the infectious diseases they may transmit.

Rabies: Stay Alert for Wild and Unfamiliar Animals



Rabies in wildlife is common, but human rabies is rare in our country due to effective post exposure prophylaxis. More than 90 percent of all animal rabies cases in North

Carolina each year

occur in wild animals: mainly raccoons, skunks, foxes and bats. All mammals, including dogs, cats, livestock and humans, are susceptible to rabies. Citizens should be educated about avoiding contact with wild and unfamiliar animals as well as stray dogs and feral cats, who are likely to be in contact with rabies-infected wildlife. If citizens are bitten by an animal instruct them to wash the wound thoroughly, seek appropriate medical care promptly and contact animal control.

Remind citizens to keep their pets up to date on rabies vaccinations. Summer is a good time to coordinate with



community veterinarians and local animal control staff to sponsor a rabies clinic. N.C. law (130A-187) requires the local health director to organize at least one low cost rabies vaccination clinic per year.

Avoid Rabies Exposures:

- Do not feed, approach or handle wild or unfamiliar animals
- Do not feed pets outside
- Keep pet's rabies vaccinations current (as required by law GS 130A-196) - all owned dogs, cat and ferrets ≥ 4 months
- Control your pets (leash and supervise) to prevent wildlife exposures
- Spay or neuter pets to decrease the numbers of stray animals
- Promptly report stray, ill animals and dead animals to animal control

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Bats

Human rabies due to unrecognized bat exposures is a known risk. If someone wakes up because a bat landed on them while sleeping or if they woke up and found a bat in their room, they should try to capture the bat safely so that it can be tested. The same precautions should be used if they see a bat in a room with an unattended child, or see a bat near a mentally impaired or intoxicated person. The small teeth of the bat can make a bite difficult to find. They also should seek medical advice right away. For bat infestations in homes, call a Wildlife Damage Control Agent www.ncwildlife.org/Nuisance_Wildlife/Nuisance_Contact_WDCA.htm. For information about bats and summer camps see www.cdc.gov/rabies/bats/contact/outdoors.html.

Protect Against Ticks-borne Diseases



Ticks in North Carolina transmit three bacterial diseases to people. Those tick-borne illnesses are Rocky Mountain Spotted Fever, Lyme disease, and Ehrlichiosis.

Avoid Tick Bites:

- Avoid high grasses, forested and brushy spots,—stay in the center of trails and areas with trimmed grass
- Wear light-colored clothing so you can see ticks
- Perform tick checks daily and safely remove attached ticks
- Consult with HCP if illness develops following tick bite
- Use DEET containing repellents and permethrin treated clothing
- Keep ticks off your pets (consult with a Veterinarian).

Want to know how to remove a tick the right way?
www.wakegov.com/environment/envirohealth/pests/tick/default.htm

Mosquito-Borne Diseases

N.C. mosquitoes carry arboviruses, including West Nile virus, Eastern equine encephalitis, and La Crosse encephalitis. Encourage appropriate precautionary measures including:

- Drain standing water to keep mosquitoes from multiplying
- Cover skin with clothing and use repellent

- Cover doors and windows with screens

Cryptosporidiosis – The Most Common Waterborne Disease

Cryptosporidiosis is a diarrheal disease caused by a parasite that lives in the intestine of humans and animals. Millions of *Cryptosporidium* oocysts passed in the stools of infected persons or animals can contaminate soil, food, water (recreational or drinking), and surfaces. The parasite is very resistant to chlorine-based disinfectants. Shedding of *Cryptosporidium* oocysts in the stool begins with first symptoms and can last for weeks after the diarrhea stops. There are simple measures to prevent this disease.



Prevent Cryptosporidiosis by good personal hygiene:

- Wash hands frequently with soap and water, especially after using the toilet, handling or feeding animals, after changing diapers, and before eating or preparing food.
- Do not eat around animals
- Do not touch your mouth with contaminated hands (i.e., after touching bathroom fixtures, changing tables, diaper pails changing diapers, surfaces in childcare centers, caring for an infected person, handling animals or animal areas, and after sexual contact)
- Do not swallow recreational water (swimming pools, hot tubs, Jacuzzis, fountains, lakes, rivers, springs, ponds, or streams) See: www.cdc.gov/healthywater/swimming
- Thoroughly wash all vegetables and fruits before eating
- Wash hands thoroughly prior to eating, handling and preparing foods

For more information on Cryptosporidiosis see www.cdc.gov/parasites/crypto/gen_info/infect.html.

The NC Division of Public Health Veterinary Public Health staff is available 24/7 for consultation at 919-733-3419.

Submitted by:

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Communicable Disease Branch

Reported Communicable Diseases, North Carolina, January-March 2011 (by date of report)*

Disease	Year-to-Date (First Quarter)			1 st Quarter 2011	Comments / Note
	2011	2010	Mean (2006-2010)		
Botulism, Infant	1	0	0	1	
Brucellosis	0	0	0	0	
Campylobacter	130	167	136	130	
Chlamydia, laboratory reports	12610	12048	8923	12610	
Creutzfeldt-Jakob Disease	0	0	0	0	
Cryptosporidiosis	23	15	13	23	
Cyclosporiasis	0	0	0	0	
Dengue	0	1	1	0	
E. coli Shiga Toxin-producing	27	5	16	27	
Ehrlichiosis, Granulocytic	1	0	0	1	
Ehrlichiosis, Monocytic	1	10	4	1	
Ehrlichiosis, Other	0	0	0	0	
Encephalitis, California Group	0	0	0	0	
Encephalitis, Arboviral, other	0	0	0	0	
Encephalitis, West Nile	0	0	0	0	
Foodborne, C. Perfringens	0	0	1	0	
Foodborne, Other	0	0	26	0	
Gonorrhea	4323	3936	3616	4323	
Haemophilus Influenzae	26	25	21	26	
Hepatitis A	4	7	16	4	
Hepatitis B	37	12	32	37	
Hepatitis B Carrier	476	131	229	476	
Hepatitis B Perinatal	0	0	1	0	
Hepatitis C, Acute	11	11	5	11	
HIV/AIDS	314	447	511	314	Note 1
Hemol.Urem.Syn/TTP	0	2	1	0	
Infl Ped Mortality	0	0	0	0	
Legionellosis	14	5	7	14	
Leptospirosis	0	0	0	0	
Listeriosis	1	4	4	1	
Lyme Disease	6	17	7	6	
Malaria	5	9	8	5	
Meninccocal Invasive Disease	8	6	8	8	
Meningitis, Pneumococcal	0	0	8	0	
Mumps	0	1	2	0	
Q Fever	0	0	0	0	
Rabies in animals	83	74	93	83	
RMSF	7	15	40	7	
Salmonellosis	264	138	210	264	

Disease	Year-to-Date (First Quarter)			1 st Quarter 2011	Comments / Note
	2011	2010	Mean (2006-2010)		
Shigellosis	73	18	45	73	
Strep A	59	44	50	59	
Syphilis, Total	194	230	174	194	Note 2
Toxic Shock Synd.,Strep	5	2	2	5	
Tuberculosis	32	24	40	24	
Tularemia	0	1	1	0	
Typhoid, Acute	2	2	2	2	
V Vulnificus	0	1	1	0	
Vibrio, Other	1	4	1	1	
VISA/VRSA (Staph aureus)	0	1	1	0	
Whooping Cough	17	66	65	17	

* Preliminary data, as of xx/xx/2011. Quarters defined as 13 week periods. Diseases reported in 2010 define those listed in this table. Notes: 1. Earliest report with HIV infection or AIDS diagnosis; 2. Includes primary, secondary and early latent syphilis.

Dr. Megan Davies, State Epidemiologist



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■ Tuberculosis (TB) Control	(919) 733-7286
Occupational and Environmental Epidemiology Branch	(919) 707-5900
State Laboratory of Public Health	(919) 733-7834
Office of the Chief Medical Examiner	(919) 966-2253
Public Health Preparedness and Response	(919) 715-0919
Public Health Preparedness and Response Emergency Number 365/7	(888) 820-0520
Rabies Emergency Number Nights, Weekends, Holidays	(919) 733-3419
Emergency Number Nights, Weekends, Holidays	(919) 733-3419